

## CLAIMS

- 1    1.    A magnetic head comprising:  
2            a write head portion including a first magnetic pole and a second magnetic pole;  
3            an induction coil being disposed at least in part between said first and second  
4    magnetic poles;  
5            an electrical lead of said induction coil being disposed in a layer of the magnetic  
6    head;  
7            a heat sink being coplanar within the magnetic head with said electrical lead of  
8    said coil.
  
- 1    2.    A magnetic head as described in claim 1 wherein said electrical lead is comprised  
2    of copper and said heat sink is comprised of copper.
  
- 1    3.    A magnetic head as described in claim 1 wherein said heat sink is disposed at  
2    least in part upon said second magnetic pole.
  
- 1    4.    A magnetic head as described in claim 1 wherein said electrical lead is fabricated  
2    upon an insulation layer that is disposed in part above said second magnetic pole, and  
3    wherein said heat sink is fabricated upon said insulation layer above said second  
4    magnetic pole.

1 5. A magnetic head as described in claim 4 wherein said heat sink includes a first  
2 substantial portion that is disposed above said second magnetic pole, and another  
3 substantial portion that is disposed away from said second magnetic pole.

1 6. A magnetic head as described in claim 5 wherein said heat sink is disposed away  
2 from an air bearing surface of the magnetic head.

1 7. A magnetic head as described in claim 1 further including a second heat sink, and  
2 wherein said heat sink and said second heat sink are thermally interconnected by a heat  
3 sink interconnect member.

1 8. A magnetic head as described in claim 7 wherein said second heat sink is  
2 disposed below said first magnetic pole.

1 9. A magnetic head as described in claim 8 wherein said heat sink is thermally  
2 interconnected through an interconnect member with a slider body portion of the  
3 magnetic head.

1 10. A magnetic head as described in claim 8 wherein said heat sink is thermally  
2 interconnected with said second heat sink through an interconnect member, and said  
3 second heat sink is thermally interconnected with said slider body through a second  
4 interconnect member.

1 11. A magnetic head as described in claim 1 wherein said magnetic head is a  
2 longitudinal head.

1 12. A magnetic head as described in claim 1 wherein said magnetic head is a  
2 perpendicular magnetic head.

3 13. A method for fabricating a magnetic head, comprising:  
4 fabricating a first magnetic pole;  
5 fabricating a second magnetic pole;  
6 fabricating an induction coil, at least in part, between said first magnetic pole and  
7 said second magnetic pole;  
8 fabricating an electrical lead to said induction coil;  
9 fabricating a heat sink member in the same fabrication step in which said  
10 electrical lead is fabricated.

1 14. A method for fabricating a magnetic head as described in claim 13, comprising:  
2 fabricating said heat sink in a location above said second magnetic pole.

1 15. A method for fabricating a magnetic head as described in claim 13 wherein said  
2 electrical lead and said heat sink are fabricated in a photolithographic process.

1 16. A method for fabricating a magnetic head as described in claim 15 wherein said  
2 photolithographic process includes the use of a mask for forming an electrical lead

3   electroplating trench, and said mask also includes an opening for forming a heat sink  
4   trench for electroplating said heat sink therewithin.

1   17.    A method for fabricating a magnetic head as described in claim 13 wherein said  
2   heat sink includes a first portion that is disposed above said second magnetic pole and a  
3   second portion that is disposed away from said second magnetic pole.

1   18.    A method for fabricating a magnetic head as described in claim 13, including the  
2   step of fabricating a second heat sink that is disposed below said first magnetic pole.

1   19.    A method for fabricating a magnetic head as described in claim 18, including the  
2   step of fabricating a thermal interconnect member between said first heat sink and said  
3   second heat sink.

1   20.    A method for fabricating a magnetic head as described in claim 19, including the  
2   further step of fabricating a thermal interconnect member between said second heat sink  
3   and a slider body portion of the magnetic head.

4   21.    A hard disk drive, comprising:  
5           at least one hard disk being adapted for rotary motion upon a disk drive;  
6           at least one slider device having a slider body portion being adapted to fly over  
7   said hard disk;

8           a magnetic head being formed on said slider body for writing data to said hard  
9 disk, said magnetic head including:  
10           a write head portion including a first magnetic pole and a second magnetic pole;  
11           an induction coil being disposed at least in part between said first and second  
12 magnetic poles;  
13           an electrical lead of said induction coil being disposed in a layer of the magnetic  
14 head;  
15           a heat sink being coplanar within the magnetic head with said electrical lead of  
16 said coil.

1   22.    A hard disk drive as described in claim 21 wherein said heat sink is disposed at  
2   least in part upon said second magnetic pole.

1   23.    A hard disk drive as described in claim 21 wherein said electrical lead is  
2   fabricated upon an insulation layer that is disposed in part above said second magnetic  
3   pole, and wherein said heat sink is fabricated upon said insulation layer above said  
4   second magnetic pole.

1   24.    A hard disk drive as described in claim 21 further including a second heat sink,  
2   and wherein said heat sink and said second heat sink are thermally interconnected by a  
3   heat sink interconnect member.

1 25. A hard disk drive as described in claim 24 wherein said second heat sink is  
2 disposed below said first magnetic pole.

1 26. A hard disk drive as described in claim 25 wherein said heat sink is thermally  
2 interconnected through an interconnect member with a slider body portion of the  
3 magnetic head.

1 27. A hard disk drive as described in claim 25 wherein said heat sink is thermally  
2 interconnected with said second heat sink through an interconnect member, and said  
3 second heat sink is thermally interconnected with said slider body through a second  
4 interconnect member.